



# **New Zealand Plant Protection Society**

*Protecting Plants with Science*

## **75<sup>th</sup> Anniversary**

# **ANNUAL CONFERENCE PROGRAMME AND ABSTRACTS 2022**

9–11 August

**Christchurch Town Hall  
New Zealand**

Full and daily registrations

Student rates available

See [www.nzpps.org](http://www.nzpps.org) for further details and registration information

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# NZPPS CONFERENCE 2022

## Tuesday 9 August 2022

8.00-8.45 am	Registration
8.45-8.55 am	Mihi Whakatao
8.55-9.00 am	Conference Opening: Mike Cripps, President
9.00-9.30 am	Opening Address: Professor Dame Juliet Gerrard

9.30-10.30 am	<b>SESSION 1: Symposium Special Session</b>
Chair:	Rebecca Campbell, Plant & Food Research

Exploring the anti-microbial potential of the kauri soil microbiome against soil pathogens <i>Alexa Byers, Nick Waipara and Amanda Black</i> .....	11
Baseline prevalence study of <i>Phytophthora agathidicida</i> and kauri dieback disease in kauri ( <i>Agathis australis</i> ) within Te Wao Nui ā Tiriwa / the Waitākere Ranges <i>Karyn Froud, Yue Chin Chew, John Kean, Lisa Tolich, Hugo Geddes, Georgia Edwards, Lee Hill, Fredrik Hjelm, Robin Taua-Gordon, Edward Ashby, Sabrina Greening, Chris Compton, James Shepherd, John Dymond, Jane Meiforth, Nari Williams, Ian Horner, Bruce Burns and Luitgard Schwendenmann</i> .....	11
The structure of the microbial community on the myrtaceous phylloplane and implications for infection by <i>Austropuccinia psidii</i> <i>Hayley J. Ridgway, Fernanda Nieto-Jacobo, Kirsty Boyd-Wilson, Soonie Chng, Loreto Hernandez, Monika Joshi and Preeti Panda</i> .....	12
Long-term phosphite trials to control kauri dieback <i>Ian J. Horner, Matthew J. Arnet, Ellena G. Hough and Mary B. Horner</i> .....	12

### 10.30-11.00 am Morning Tea

11.00 am-12.30 pm	<b>SESSION 2: Pests 1</b>
Chair:	Adriana Najjar-Rodriguez, Plant & Food Research

Impact of guttation fluid from standard, AR1 and AR37 endophyte-infected perennial ryegrass on <i>Microctonus aethioides</i> adult longevity <i>Philippa Gerard and Ela Hiszczyńska-Sawicka</i> .....	13
Olfactory responses of Argentine stem weevil to herbivory and endophyte-colonisation in perennial ryegrass <i>Louise M. Hennessy, Alison J. Popay, Travis R. Glare, Sarah C. Finch, Vanessa M. Cave and Michael Rostás</i> ...	13
<i>Serratia proteamaculans</i> AGR96X provides effective control of the New Zealand grass grub <i>Costelytra giveni</i> and manuka beetle ( <i>Pyronota</i> spp.) in a range of crops <i>Mark Hurst, Sarah Mansfield, Richard Townsend, Laura Villamizar, Jayanthi Swaminathan, David Wright, Jo Townshend, Ricky Brown, Amy Beattie, Sandra Young, Mitchell Weston and Maureen O'Callaghan</i> .....	14
Know thy enemy: non-sequenced based tool to identify species of manuka beetle and grass grub larvae <i>Nicola K. Richards, Sarah Mansfield, Richard J. Townsend and Mark R.H. Hurst</i> .....	14
Potential organic insecticides for bronze beetle control <i>Sarah Wyatt, David Rogers and Jim Walker</i> .....	15
Bayesian Network Tool and expert opinions used to make predictions of probabilities of non-target attack from introduced biological control agents <i>Nicolas Meurisse, Toni M. Withers, Belinda Gresham, Mike Davy, Andrew Pugh, Jacqui Todd and Barbara Barratt</i> .....	15

**12.30-1.30 pm**

**Lunch**

**1.30-2.30 pm**

**SESSION 3: Weeds 1**

Chair:

Trevor James, AgResearch

Changes in arable weed control issues over the past 75 years

Kerry C. Harrington, M. Philip Rolston and Hossein Ghanizadeh .....16

A century of weed change in New Zealand's forage seed multiplication industry

Jesse M. Rubenstein, M. Philip Rolston, Philip E. Hulme, Alan V. Stewart, Jennifer L. Bufford and John G. Hampton .....16

Screening indigenous tree species for herbicide tolerance at rates required for effective vegetation management

Justin Nairn, Brian Richardson and Carol Rolando.....17

Golden dodder (*Cuscuta campestris*) seed longevity and plant hosts in wetland environments

Deborah Hackell, Trevor James and Kerry Bodmin.....17

**2.30-3.30 pm**

**SESSION 4: Horticultural Pathogens 1**

Chair:

Seona Casonato, Lincoln University

Evidence of phosphonate tolerance in *Phytophthora cinnamomi* from New Zealand avocado orchards

Shannon Hunter, Rebecca McDougal, Nari Williams and Peter Scott .....18

Colonisation of sweet cherry buds (*Prunus avium*) by *Pseudomonas syringae* pathovars in commercial orchards in Central Otago

Virginia Marroni, Seona Casonato, Andrew Pitman, Robert Beresford, Sandra Visnovsky and E. Eirian Jones ...18

Are kiwifruit vines responsive to Actigard application after fruit harvest?

Tony Reglinski, Joel Vanneste, Magan Schipper, Jenny Oldham, Deirdre Cornish, Janet Yu, Christina Fehlmann, Frank Parry, Jordan McAlinden and Duncan Heddeley.....19

Impact of pollen naturally contaminated by *Pseudomonas syringae* pv. *actinidiae* (Psa) on disease incidence in a commercial kiwifruit orchard

Joel Vanneste, Deirdre Cornish, Janet Yu, Magan Schipper, Duncan Hedderley and Jenny Oldham.....19

**3.30-3.45 pm**

**Afternoon Tea**

**3.45-4.30 pm**

**SESSION 5: Forest Pathogens**

Chair:

Nick Waipara, Plant & Food Research

*Ilyonectria* and *Dactylonectria* species from *Pinus radiata* in New Zealand

Kiryn Dobbie, Vageesha Neththikumara, Darryl Herron and Rebecca L. McDougal.....20

*Trichoderma* bioinoculants for increased growth and reduced foliar diseases of *Pinus radiata* in New Zealand forests

Helen Whelan.....20

Characterisation of a novel double-stranded RNA Virus from *Phytophthora pluvialis* in New Zealand

Zhi Xu, Mahmoud E. Khalifa, Falk Kalamorz, Rebekah A. Frampton, Grant R. Smith, Rebecca L. McDougal and Robin M. MacDiarmid .....21

4.30-5.30 pm

**SESSION 6: Biosecurity 1**

Chair:

Karyn Froud, Biosecurity Research Ltd

Frequent flyers: Globally, not all Lepidoptera are equally likely to establish  
*Richard Mally, Rebecca M. Turner, Rachael E. Blake, Gyda Fenn-Moltu, Cleo Bertelsmeier, Eckehard G. Brockerhoff, Robert J.B. Hoare, Helen F. Nahrung, Alain Roques, Deepa S. Pureswaran, Takehiko Yamanaka and Andrew M. Liebhold*.....22

Māori and Pasifika indigenous collaboration to identify pre-border biosecurity threats to New Zealand taonga  
*Te Whaeoranga Smallman, Alby Marsh and Julia Soewarto*.....22

How do we find biosecurity hazards (semi-) automatically?  
*Sarah Sapsford, Michal Kuchár and Andreas Makiola*.....23

Exploring the utility of sentinel plants for biosecurity risk assessment for New Zealand indigenous plants  
*David AJ Teulon, Kirsty Boyd Wilson, Sandra B Visnovsky, Ronny Groenteman, Lucia Ramos Romero, Alby Marsh and Mark R. McNeill*.....23

**5.30-6.30 pm**

**Posters/Drinks & Nibbles**

Rapid ID guides – bringing insect identification to the non-taxonomist  
*Joanne Poulton and Jessica Vereijssen*.....24

Thrips species and population trends over the strawberry growing season  
*Aliesha M. Kean, Jessica Vereijssen, Robert Silberbauer and Mette-Cecilie Nielsen*.....24

Spittlebug (Hemiptera: Aphrophoridae) occurrence and abundance in unmanaged areas neighbouring commercial vineyards in Waipara  
*Lisa M. Watkins, Jess Preddey and Jessica Vereijssen*.....25

The ambrosia beetle *Xyleborinus saxesenii* infesting fruit trees in New Zealand  
*Roger Wallis, Jim Walker and Lyn Cole*.....25

Evaluation of resistance and tolerance of barley cultivars to ramularia leaf spot in a detached leaf assay  
*Monika Joshi, Rachael Warren, Ruth Butler, Joanne Drummond and Soonie Chng*.....26

Distribution and frequency of mitochondrial genotypes in New Zealand tomato potato psyllid populations  
*Gabrielle Drayton, Shea Addison, Jessica Vereijssen and Rebekah Frampton*.....26

Harlequin ladybird (*Harmonia axyridis*) in vineyards: monitoring protocols for a potentially invasive insect  
*Tara Taylor, Roger Wallis and Vaughn Bell*.....27

Winter cover crops to reduce herbicide inputs in New Zealand maize crops  
*Mike Trollove, Trevor James, Ben Wynne-Jones, Harold Henderson and Pip Gerard*.....27

Sensitivity shift of *Zymoseptoria tritici* to demethylation inhibitor fungicides in New Zealand  
*Rachael Warren, Monika Joshi, Virginia Marroni, Joanne Drummond and Shirley Thompson*.....28

Exploring the host range of *Metarhizium novozealandicum* (C14) against some common insect pests in New Zealand  
*Nghia Nguyen, Josefina Narciso, Samuel Tourtellot, Hossein Alizadeh, John G. Hampton and Travis Glare*.....28

Detection of yellow dwarf virus species carried by New Zealand cereal aphids  
*Sarah Thompson, Simon Bulman, Sandi Keenan, Abie Horrocks, Stacey Skill, Robert Silberbauer, John Fletcher and Melanie Davidson*.....29

Impact of myrtle rust (*Austropuccinia psidii*) on *Lophomyrtus* spp. reproduction  
*Maria Zhulanov, Julia Soewarto, Michael Bartlett, Stuart Fraser, Roanne Sutherland, Kristin Gillard and Elizabeth Miller*.....29

Microsclerotia of the fungal entomopathogen *Metarhizium robertsii*: Formation, virulence and tolerance to abiotic factors  
*Lorena Garcia Riaño, Gloria Patricia Barrera, Leonardo Castellanos Hernandez and Laura Fernanda Villamizar*.....30

Mould mites, <i>Tyrophagos</i> spp., mortality response to phosphine fumigation under low oxygen atmosphere <i>Kambiz Esfandi, Amanda Hawthorne, Saeedeh Afsar, Natalie Page-Weir, Cristian Baldassarre, Samuel Brown, Lisa Jamieson and Duncan Hedderley</i> .....	30
Assessing the climatic risk of establishment of rapid 'ōhi'a death (ROD) in New Zealand and the South Pacific islands <i>Luna Hasna, Robert Beresford and Rebecca Campbell</i> .....	31
Myrtle rust surveillance in Aotearoa – communicating a story as it unfolds <i>Dhairyasheel Desai and Rebecca Campbell</i> .....	31
The potential impact of fall armyworm ( <i>Spodoptera frugiperda</i> ) to plants of value to Māori <i>David AJ Teulon, Taylah Dalton, Teresa Waiariki, Craig Phillips and Alby Marsh</i> .....	32
Short term impacts of grazing by dairy cows on arthropods in dairy pasture <i>Mark R. McNeill and Chikako van Koten</i> .....	32
Exploring the nature of <i>Arhopalus fesus</i> (Coleoptera: Cerambycidae, Spondylidinae) pheromone attraction <i>Cecilia M. Romo, Georgia Dickson, Jessica Kerr and John Sweeney</i> .....	33
Grass grub is spreading on the South Island's West Coast <i>Mark R. H. Hurst, Nicola K. Richards, Ricky Brown and Sarah Mansfield</i> .....	33
A novel real-time PCR for species-specific identification of the giant African snail <i>Lissachatina fulica</i> <i>Hui Wen Lee, Dongmei Li, Qing Hai Fan, Wellcome Ho, Disna Gunawardana, Brett Alexander and Jeyaseelan Baskarathevan</i> .....	34
Searching for fungal mycoherbicides effective against climbing asparagus ( <i>Asparagus scandens</i> ) in New Zealand <i>Tianyi Tang, Dan Blanchon, Paul Bell Butler, Nick Waipara, Lilith Fisher and Holly Cox</i> .....	34

# Wednesday 10 August 2022

## 9.00-9.30 am Keynote Presentation

A macroecological perspective of herbicide resistance in weeds  
*Prof. Philip Hulme, Lincoln University*.....35

9.30-10.45 am	<b>SESSION 7: Biocontrol</b>
Chair:	Toni Withers, Scion

Effects of California thistle (*Cirsium arvense*) endophytes and environment on establishment of rust fungus, *Puccinia punctiformis*, a potential biocontrol agent  
*Wendy Kentjens, Seona Casonato and Clive Kaiser* .....36

Natural enemies associated with variegated thistle (*Silybum marianum*) and the potential for biological control  
*Michael Cripps and Jonty Mills*.....36

A long and winding road – the process of importing a rust fungus *Uromyces pencanus* as a biocontrol agent of Chilean needle grass (*Nassella neesiana*) in New Zealand  
*Alana Den Breeven, Freda Anderson, Jane Barton and Chantal Probst* .....37

Combining entomopathogens for more efficient management of fall armyworm in maize  
*Juliana Andrea Gomez, Paola Emilia Cuartas, Carlos Espinel, Gloria Patricia Barrera and Laura Fernanda Villamizar*.....37

Identification of potential biocontrol agents for the management of riggut brome seed  
*Emily Gerard, Trevor James, Chikako van Koten and Maureen O’Callaghan* .....38

## 10.45-11.15 am Morning Tea

**11.15-11.25 am NZPPS 75<sup>th</sup> Anniversary Review:**  
*Dr Mike Cripps, NZPPS President*.....39

11.25 am-12.45 pm	<b>SESSION 8: Special session on Pacific Biosecurity</b>
Chair:	Geoff Mavromatis (The AgriBusiness Group (ret.))

Plant protection – an international perspective for Pacific development  
*Trevor A. Jackson*.....40

The role of Pacific Community (SPC) for plant protection in the Pacific region  
*Mark Ero and Fereti Atumurirava*.....41

Enhanced Pacific Biosecurity Partnership – Overview of previous and future capability development work  
*Katharina M. Hofer, Disna Gunawardana and Lalith Kumarasinghe*.....41

The Pacific Regional Invasive Species Management Support Service: supporting invasive species management in the Pacific  
*Monica Gruber and Visoni Timote*.....42

Towards improving pest management strategies against *Oryctes rhinoceros*, a re-emerging invasive pest in the Pacific  
*Sean D.G. Marshall, Sarah Mansfield, Laura F. Villamizar, Sulav Paudel and Trevor A. Jackson*.....42

Natural Enemies – Natural solutions for invasive weeds in the Pacific  
*Lynley Hayes, Quentin Paynter and Temo Talie*.....43

Support for plant protection and biosecurity in the Pacific through the Ministry of Foreign Affairs and Trade and the New Zealand Aid Programme  
*Guy Redding*.....43

Panel Discussion

**12.45-1.45 pm**

**Lunch**

**1.45-2.45 pm**

**SESSION 9: Arable and Soil Pathogens 1**

Chair:

Soonie Chng, Plant & Food Research

The effect of within plant fungal spread on the severity of stem rust infection in ryegrass seed crops <i>Nicholas Davies, M. Philip Rolston and Richard Sim</i> .....	44
Downey mildew, a new disease in cocksfoot seed crops <i>Richard Chynoweth, M. Philip Rolston, Mark Braithwaite and H. Marr</i> .....	44
Ramularia: managing the threat to barley crops <i>Joanne Drummond, Rachael Warren, Monika Joshi, Lewis Braithwaite, Mark Braithwaite, Matthew Hicks and Soonie Chng</i> .....	45
Improving perennial ryegrass seed yields in take-all affected fields in Canterbury <i>Diwakar R.W. Kandula, John G. Hampton, Hossein Alizadeh and M. Philip Rolston</i> .....	45

**2.45-3.30 pm**

**SESSION 10: Grape pathogens**

Chair:

Eirian Jones, Lincoln University

The microbiome structure of disease-escape grapevines in New Zealand <i>Damola Adejoro, E. Eirian Jones, Hayley J. Ridgway, Dion C. Mundy, Bhanupratap Vanga and Simon Bulman</i> ....	46
Effect of carbohydrate stress and grafting on symptoms in potted grapevines dual inoculated with <i>Seimatosporium</i> sp. and <i>Neofusicoccum parvum</i> <i>Noureddine Besselma, Hayley J. Ridgway, and E. Eirian Jones</i> .....	46
Three management scenarios using Marlborough Sauvignon blanc to calculate the potential economic costs of grapevine trunk diseases in New Zealand <i>Dion C. Mundy and Glen Greer</i> .....	47

**3.30-3.35 pm**

**Drinks Break**

**3.35-5.00 pm**

**Annual General Meeting**

**7.00 pm**

**Conference Dinner**



# Thursday 11 August 2022

## 9.00-9.30 am Keynote Presentation

Complexities of applying aerial sprays to manage forest weeds, insect pests and diseases  
*Dr Brian Richardson, Scion/Forest Growers Research*..... 48

9.30-10.45 am	<b>SESSION 11: Biosecurity 2</b>
Chair:	David Teulon, Plant & Food Research

Monitoring biosecurity risks – the story of a collaborative sector approach to maintain pest and disease awareness  
*Sally Anderson and Lisa Wong*..... 49

The potential of X-ray disinfestation technology in New Zealand  
*Lisa Jamieson, Jack Armstrong, Helen Gear, Jung Cho, Barbara C. Waddell, Samuel Brown, Peter Follett and Allan Woolf*..... 49

Current status and prospects for phytosanitary treatments  
*Kambiz Esfandi, Lisa Jamieson and Dave Bellamy*..... 50

Blowin' in the wind: Invasive pests travel vast distances along predictable aerial pathways  
*Ilse Pretorius, Wayne C. Schou, Brian Richardson, Shane D. Ross, Toni M. Withers, David G. Schmale and Tara M. Strand*..... 50

Using Chinese laugaugae databases to identify potential biosecurity risks to New Zealand's pastures  
*Yujie Han, Craig Phillips, Scott Hardwick, Colin Ferguson and Mark McNeill*..... 51

## 10.45-11.00 am Morning Tea

11.00 am-12.00 pm	<b>SESSION 12: Pests 2</b>
Chair:	Travis Glare, Lincoln University

Spider biodiversity in crop orchard systems (Te kanorau koiora o te pūngāwerewere i roto i ngā pūnaha hauropi huanga kai)  
*Nicola Sullivan, Cor Vink, Amanda Black, Joanna Sharp and Alby Marsh*..... 52

Determining on-orchard risk factors for apple leafcurling midge  
*Peter Lo, Jim Walker, Anna Kokeny and Roger Wallis*..... 52

Phenology and natural enemies of *Paropsisterna cloelia* in Marlborough  
*Carolin Weser, Steve Pawson and Toni M. Withers*..... 53

Remote sensing to assess paropsine damage on *Eucalyptus* trees  
*Leslie Mann, Vega Xu, Justin Morgenroth and Stephen Pawson*..... 53

12.00 pm-1.00 pm	<b>SESSION 13: Weeds 2</b>
Chair:	Kerry Harrington, Massey University

Nassella tussock – a new web app to guide management  
*Graeme Bourdôt, Shona Lamoureux and Alasdair Noble*..... 54

Rotation, rotation, rotation! Expanding the herbicide Mode-of-Action options for grass weed control in cereals  
*Ben Harvey, M. Philip Rolston and Matilda Gunnarson*..... 54

Surveying for herbicide resistant weeds in Bay of Plenty and Waikato maize  
*Zachary Ngow, Ben Wynne-Jones, Trevor James and Christopher E. Buddenhagen*..... 55

Detecting weed seeds in seed for sowing: a case study  
*Christopher E Buddenhagen, Ben Wynne-Jones and Deborah Hackell*..... 55

1.00-1.30 pm

Light Lunch

1.30-3.00 pm

**SESSION 14: Arable and Soil Pathogens 2**

Chair:

Richard Chynoweth, Foundation for Arable Research

*Coniothyrium minitans* suppress the carpogenic germination and viability of *Sclerotinia sclerotiorum* sclerotia, alone or in combination with Perka

Madhavi Dassanayaka, E. Eirian Jones and Seona Casonato .....56

Development of a field bioassay for rapid detection of *Candidatus Liberibacter solanacearum* (Lieft.) in potato (*Solanum tuberosum* L.) leaves and tubers

Charan Yuvaraj Sivakumar, Hamish Rafe Gow, Seona Casonato, Roger Hugh Blyth, Kelsey Galimba and Clive Kaiser .....56

Plant protection technology transfer to produce 'Safe Vegetables' in Vietnam

Kirsteen S.H. Boyd-Wilson, Graham P. Walker, Peter Wright, David J. Rogers, Rashmi Kant, Barbara C. Waddell and Michael Lay-Yee .....57

The importance and persistence of seed-borne *Ramularia collo-cygni* in barley as a source of disease spread

Soonie Chng, Monika Joshi, Rachael Warren, Joanne Drummond and Ruth Butler .....57

Intra and inter-kingdom signalling mediated by fungal volatile organic compounds

Artemio Mendoza-Mendoza, Maria Fernanda Nieto-Jacobo, Valter Cruz Magalhães, Eline van Zijl de Jong, Michael Rostás, Janaki Kandula, Diwakar Kandula, Leandro Lopes Loguercio, Ulises Esquivel Naranjo and John G. Hampton .....58

Soil organic matter quality and the soil immune response

Bryony Dignam, Shengjing Shi, Sean Marshall, Alasdair Noble, Emily Gerard, Lee Aalders, Faith Mtandavari and Nigel Bell .....58

3.00-4.15 pm

**SESSION 15: Horticultural Pathogens 2**

Chair:

Virginia Marroni, Plant & Food Research

Integrated use of *Aureobasidium pullulans* strain CG163 and Acibenzolar-S-methyl for management of bacterial canker in kiwifruit

Huub de Jong, Tony Reglinski, Philip A.G. Elmer and Kirstin Wurms .....59

The effects of *Aureobasidium pullulans* formulations and acibenzolar-S-methyl on the incidence and severity of fire blight floral infections

Mary Horner and Caitlin Donahoe .....59

Can composting infected woody debris provide an effective disease disposal method for European canker?

Lizelle Vorster, Rebecca Campbell, Monika Walter, Renate Eder-Cools, Reiny Scheper and Norman Petereit ....60

Modelling spatial spread and control strategies for *Neonectria ditissima* in apples

Rebecca Campbell and Robert Beresford .....60

Infection of apple fruit by *Phlyctema vagabunda*

Kerry R. Everett, Luna Hasna, Shamini I.P.S. Pushparajah, Michelle J. Vergara, Peter N. Wood, Brent M. Fisher..61

4.15-4.30 pm

**Emerging Speaker Award / Conference Closing**

## SESSION 7: BIOCONTROL

### **A long and winding road – the process of importing a rust fungus *Uromyces pencanus* as a biocontrol agent of Chilean needle grass (*Nassella neesiana*) in New Zealand**

Alana Den Breeyen<sup>1</sup>, Freda Anderson<sup>2</sup>, Jane Barton<sup>3</sup> and Chantal Probst<sup>1</sup>

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<sup>3</sup> Contractor to Landcare Research New Zealand, 14 Amber Lane, RD 1, Hamilton 3281, New Zealand

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Chilean needle grass [CNG] (*Nassella neesiana*) is mostly a pasture weed in New Zealand where it outcompetes and displaces pasture species and can cause major damage to stock. Native to Argentina, CNG is widespread in Hawke's Bay and Marlborough, with smaller sites in northern Canterbury and Auckland. A rust fungus, *Uromyces pencanus*, was identified as the most suitable biocontrol candidate against CNG, with strain UP27 shown to be highly host specific after extensive research undertaken in Argentina. In 2011, the New Zealand Environmental Protection Authority (EPA) granted permission to import *Uromyces pencanus*. In 2017, additional host range testing, undertaken for Australia, resulted in the unexpected production of *U. pencanus* spores on two non-target *Austrostipa* species from Australia. Ten years on, permission to export the rust fungus from Argentina was finally approved during the Covid-19 pandemic, giving a three-month export permit. The journey from finding a suitable biological control agent for CNG to getting a culture into New Zealand and the future outlook of this project are discussed.

### **Combining entomopathogens for more efficient management of fall armyworm in maize**

Juliana Andrea Gomez<sup>1</sup>, Paola Emilia Cuartas<sup>2</sup>, Carlos Espinel<sup>1</sup>, Gloria Patricia Barrera<sup>1</sup> and Laura Fernanda Villamizar<sup>3</sup>

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The fall armyworm *Spodoptera frugiperda* is a polyphagous pest able to cause important agricultural losses. The pest has rapidly spread worldwide, being recently detected in parts of New Zealand in March and April 2022. Among the natural enemies of *S. frugiperda*, pathogens such as bacteria, fungi and viruses represent an environmental alternative to chemical insecticides. In this work, we studied the potential of combining one virus from the Baculoviridae family (Nucleopolyhedrovirus, NPV) and one strain of the fungus *Metarhizium rileyi* to control *S. frugiperda* under laboratory, greenhouse, and field conditions. The combined use of NPV and *M. rileyi* applied simultaneously showed an additive effect in laboratory, causing higher larval mortality than the biocontrol agents used separately. Some dead larvae showed mixed infection, with swollen bodies (viral infection sign), accompanied by fungus hyphae emerging from the cadavers. Under greenhouse conditions, the mixture of both entomopathogens (50:50) caused 63.3% mortality and significantly reduced insect damage plants. Finally, under field conditions, the individual or sequential application of NPV and *M. rileyi* using 100% of their recommended doses, and the simultaneous application of both entomopathogens at 50% of their recommended doses, significantly reduced the recent foliar damage to levels under the threshold for economic losses (30% fresh damage), while the damage reached 43% when control measures were not used. Results allowed to conclude that the combined application of NPV and *M. rileyi* (two biocontrol agents with different modes of action) is a promising strategy to develop sustainable integrated management programmes to control fall armyworm.